

ABSTRACT

A method of establishing a multicast transfer route is disclosed that can reduce the cost of entire route under a constraint on delay incurred between 5 starting point and ending points. The method includes the steps of: computing the shortest route with respect to delay connecting the starting point and the plural ending points based on measurement result; computing delay from a node on the shortest route to each ending point and the 10 greatest delay; removing, if the greatest delay satisfies a delay condition, the greatest-cost route from the shortest route in accordance with selection criteria effective for cost reduction; dividing the multicast transfer route into two route trees; and establishing 15 separately computed route as a complementary route that complement the removed route for connecting the two route trees. A method of multicast label switching for realizing the above method is also disclosed. A multicast label switching route is established using hierarchical 20 labels by establishing a common multicast label switching route using a first layer label and establishing plural partial multicast label switching routes for subgroup destinations using lower layer labels. A relay node recognizes the hierarchical labels thereby to label-switch 25 using all hierarchical labels.

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(71) 出願人(米国を除く全ての指定国について): 日本電信電話株式会社 (NIPPON TELEGRAPH AND TELEPHONE CORPORATION) [JP/JP]; 〒1008116 東京都千代田区大手町二丁目3番1号 Tokyo (JP).

(72) 発明者: および

(75) 発明者/出願人(米国についてのみ): 安川正祥 (YASUKAWA, Seisho) [JP/JP]; 〒1808585 東京都武蔵野市緑町3丁目9-11 NTT知的財産センタ内 Tokyo (JP). 杉園幸司 (SUGISONO, Koji) [JP/JP]; 〒1808585 東京都武蔵野市緑町3丁目9-11 NTT知的財産センタ内 Tokyo (JP). 宇賀雅則 (UGA, Masanori) [JP/JP]; 〒1808585 東京都武蔵野市緑町3丁目9-11 NTT知的財産センタ内 Tokyo (JP).

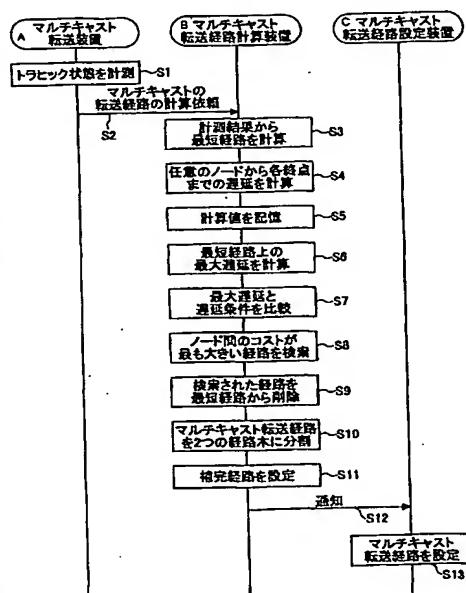
(74) 代理人: 伊東忠彦 (ITO, Tadahiko); 〒1506032 東京都渋谷区恵比寿4丁目20番3号 恵比寿ガーデンプレイスタワー32階 Tokyo (JP).

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(54) Title: MULTICAST TRANSFER ROUTE SETTING METHOD, AND MULTICAST LABEL SWITCHING METHOD FOR IMPLEMENTING FORMER METHOD

(54) 発明の名称: マルチキャスト転送経路設定方法、及びそれを実現するためのマルチキャストラベルスイッチング方法



A...MULTICAST TRANSFER DEVICE
B...MULTICAST TRANSFER ROUTE CALCULATION DEVICE
C...MULTICAST TRANSFER ROUTE SETTING DEVICE
S1...MEASURE TRAFFIC STATE
S2...ASK FOR CALCULATION OF MULTICAST TRANSFER ROUTE
S3...CALCULATE SHORTEST ROUTE ON THE BASIS OF MEASUREMENT RESULT
S4...CALCULATE DELAYS FROM GIVEN NODE TO END POINTS
S5...STORE CALCULATED VALUES
S6...CALCULATE MAXIMUM DELAY ON SHORTEST ROUTE
S7...COMPARE MAXIMUM DELAY WITH DELAY CONDITION
S8...SEARCH FOR ROUTE WITH HEAVIEST COST BETWEEN NODES
S9...EXCLUDE SOUTHERN ROUTE FROM SHORTEST ROUTES
S10...DIVIDE MULTICAST TRANSFER ROUTE INTO TWO ROUTE TREES
S11...SET SUPPLEMENT ROUTE
S12...NOTIFICATION
S13...SET MULTICAST TRANSFER ROUTE

(57) **Abstract:** A multicast transfer route setting method wherein the shortest route in terms of delay time out of the routes from a starting point to end points is determined by calculation, the delays from a given node on the shortest route to the end points and the maximum delay are calculated, the maximum cost route is excluded from the shortest route according to a selection criterion effective in reducing the cost of the overall tree if the maximum delay meets the delay condition, the multicast transfer route is divided into two route trees, another route determined by calculation is set as a supplement route for the excluded route to interconnect the two route trees. When a multicast label switching route is set, a shared multicast label switching route is set through a first layer label of the hierarchical labels and partial multicast label switching routes addressed to a sub-group in a lower layer. A relay node judges hierarchical labels to carry out label switching of all the hierarchical labels.

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